



Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

15-AMRP-0357

OCT 01 2015

Ms. J. A. Hedges, Program Manager
Nuclear Waste Program
State of Washington
Department of Ecology
3100 Port of Benton
Richland, Washington 99354

Addressees:

ENGINEERING EVALUATION/COST ANALYSIS FOR 200-BP-5 OPERABLE UNIT
GROUNDWATER EXTRACTION, DOE/RL-2015-26, DRAFT A, RESPONSE TO
ECOLOGY COMMENTS

This provides the U.S. Department of Energy Richland Operations Office (RL) response to the Washington State Department of Ecology (Ecology) comments on the Engineering Evaluation/Cost Analysis (EE/CA) for 200-BP-5 Operable Unit Groundwater Extraction, DOE/RL-2015-26, Draft A received by letter 15-NWP-164, dated September 2, 2015.

Ecology included three comments of concern and a Review Comment Record (RCR) with 49 specific comments. Responses to the three comments of concern are provided below and the attached RCR provides RL's responses to the 49 specific comments.

Comment 1

The purpose and scope of the removal action must be clarified.

Response

RL agrees and additional clarification will be provided.

Comment 2

Insufficient removal action alternatives are considered (e.g. send effluents to the Treated Effluent Disposal Facility).

Response

RL disagrees. The purpose of the EE/CA is to evaluate whether or not to continue groundwater extraction following completion of the approved treatability test (aquifer test). The decision has already been made in the approved treatability test plan to send extracted groundwater via pipeline to the 200 West facility for treatment (Treatability

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Test Plan for the 200-BP-5 Groundwater Operable Unit, DOE/RL-2010-74, Revision 2, May 2015). Thus the two alternatives of no action or extraction of groundwater are appropriate.

Comment 3

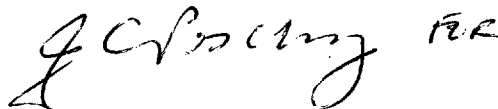
Specific cost estimates are not provided as outlined in EPA/540/R-93/057, EPA/540/P-90/003, and OSWER Publication 9360.0-02C.

Response

RL agrees. A cost estimate for continuing to extract groundwater will be added.

These comment responses were sent via email to Ecology on September 23, 2015, to expedite review. If you have any questions, please contact me, or your staff may contact, Mike Cline, of my staff, on (509) 376-6070.

Sincerely,



Ray J. Corey, Assistant Manager
for the River and Plateau

AMRP:JGM

Attachment

cc w/attach:

C. C. Arola, CHPRC
G. Bohnnee, NPT
J. V. Borghese, CHPRC
R. Buck, Wanapum
M. H. Doornbos, CHPRC
W. R. Faught, CHPRC
D. A. Faulk, EPA
G. M. Hanson, CH2
S. Hudson, HAB
R. Jim, YN
N. M. Menard, Ecology

T. Mullin, Ecology
K. Niles, ODOE
C. P. Noonan, MSA
R. E. Piippo, MSA
D. Rowland, YN
R. Skeen, CTUIR
M. J. Turner, MSA
C. D. Wittreich, CHPRC
Administrative Record
Environmental Portal

Review Comment Record			Washington State Department of Ecology Nuclear Waste Program Cleanup Section/ER Project		Date August 02, 2015
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Document Title(s)/Number(s): Engineering Evaluation/Cost Analysis for the 200-BP-5 Groundwater Operable Unit Groundwater Extraction, DOE/RL-2015-26, Draft A					
		Document Lead/Phone #/email: Tim Mullin, (5 09 372-7970, tim.mullin@ecy.wa.gov		Manager/Phone #/email: Nina Menard, (509) 372-7941, nina.menard@ecy.wa.gov	
Item # Page # Section # Line/¶ #s	Comment and Basis/Justification	Modification Needed	DOE Response	Ecology Response	O/C
Item 1 P: 1 S: 1.1 L/¶: 19-32	<p>Comment: The Purpose and Scope (Need) section is incomplete, inaccurate, and/or not specific enough. The statement, “will use this EE/CA as the basis for determining the best method for control of contaminants in the GW to minimize potential risks to HHE” is incomplete. It does not adequately describe the limited area to be used, does not specifically identify the contaminants identified compared to the applicable WP, and does not link this effort to adding information to the 200- BP-5 FS that is required for this OU.</p> <p>The statement “removal action is consistent with the RAOs of previous RODs” is inaccurate. There are no final RODs concerning GW cleanup in the B Tank Farm areas, and if there were, they would be to be specifically identified.</p> <p>Basis/Justification: Completeness and accuracy.</p>	Per the comments, add further description of what, where, and why this EE/CA is being used. Correctly identify if this is related to and consistent with previous final ROD decisions and/or Central Plateau cleanup efforts	Response: Accept, will add further description as requested, including the EECA/AM/RDRAWP process. Will also discuss consistency with Central Plateau groundwater RODs/cleanup efforts.		
Item 2 P: 1 S: 1.1 L/¶: 26-28	<p>Comment: The paragraph on the removal action being consistent with previous remedial action objectives is not required for an ECCA.</p> <p>Basis/Justification: The EPA Guidance on EC/CAs doesn’t require any RAOs</p>	Delete sentence	Response: Accept, sentence will be deleted.		
Item 3 P: 3 S: 2 L: Figure 2	<p>Comment: Figure 2 only shows plume information for nitrate, Tc-99, and uranium. However, wells shown on figure 2 include wells 299-E33-38, 299-E33-342, and 299-E33-42, have historically had a number of other contaminants.</p> <p>Basis/Justification: The following wells/contaminants exceed criteria of concern: individual contaminant concentration limits, and/or a total hazard index of 1, and/or total cancer risk criteria. Also, it is not evident that the pump and treat system will remove the contaminants listed below except those that are on Tables 1 and 2.</p> <p><u>Well 299-E33-38</u> Associated Unit: B-BX-BY</p> <p>Carcinogens: Arsenic, I-129, Tc-99, tritium, uranium (high – convert to isotopes) Hazards: Antimony, arsenic, chromium, cobalt, cyanide, hexavalent chromium, mercury, nitrate, selenium, uranium</p>	These wells and their associated contaminants should be retained for both risk assessments and future monitoring.	<p>Response: The title on Figure 2 will be corrected to “Location of the Extraction Well and Associated Groundwater Monitoring Wells for the Treatability Test Plan Removal Action near WMA B-BX-BY”. The specific monitoring wells network to monitor the removal action will be defined in the Removal Action Work plan (RAWP) following the Action Memo (AM).</p> <p>Well locations in the vicinity of B Complex are shown in Figure 4.</p>		

O/C = open or closed

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	<u>Well 299-E33-342</u> Associated Unit: B-BX-BY Carcinogens: Am-241, C-14, Co-60, I-129, Pu-239/240, Tc-99, Sr-90, tritium Hazards: Antimony, carbon tetrachloride, cyanide, hexavalent chromium, nitrate (N), uranium <u>Well 299-E33-42</u> Associated Unit: B-BX-BY Carcinogens: I-129, Tc-99, tritium Hazards: Cyanide, hexavalent chromium, nitrate (N), n-nitrosodi-n-dipropylamine, selenium, silver, uranium				
Item 4 P: 3 S: 2 L: 5	Comment: In the sentence change “remediation” to “removal” Basis/Justification: An EE/CA is a removal action.	Change sentence as described	Response: Accept.		
Item 5 P: 4 S: 3.1 L: 29	Comment: The statement is made “facilities, and the <u>200 North Area</u> formerly used for” uses an incorrect term: ‘200 North Area’. There is no such term as the 200 North Area. There is the 200 West or 200 East Area, but not this term. Basis/Justification: Completeness and accuracy.	Be more specific and identify the area this incorrect term is attempting to describe.	Response: Accept, the text will be revised to clarify the specific area being discussed. However, there are a series of waste sites just north of the Central Plateau that have been referred to as the 200 North Area.		
Item 6 P: 5 S: 3.1 L: 7-14	Comment: The statement is made “the primary aquifer impacted by past waste disposal operations and is the focus of this EE/CA.” This is inaccurate, as the focus is, in part, the cleanup of contaminants/co-contaminants and the viability of sending effluents to the ZP Treatment Plant instead of to ETF. The language here does not put into the correct context the focus of this EE/CA. The statement is made “These contaminants and co-contaminants extracted as part of this NTCRA will also be treated at the....” This in inadequate language. The correct context is treating the contaminants and co-contaminants that have been identified in the WP. In addition, the specific contaminants and co-contaminants should be identified here. This whole section 3.1 is poorly worded and does not accurately depict the situation for evaluation leading up to this EE/CA.	Make language improvements with additional details as described in the comments.	Response: Partially Accept. The text will be modified to include that removal of contaminants from the aquifer is a focus of the EE/CA. However, during preparation of the approved treatability test plan (DOE/RL-2010-74) and during a 9/14/2014 meeting with Ecology, it was agreed that the 200 West P&T system would receive effluents from the 200-BP-5 treatability test. The text will be revised to provide a more detailed discussion of contaminants. Cesium-137, Strontium-90, and Plutonium-239/240 are not detected in the B Complex and will be deleted from the discussion.		

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	Basis/Justification: Completeness and accuracy.				
Item 7 P: 5 S: 3.1 L: 9-15	<p>Comment: Is there treatment capability and capacity for the treatment of I-129, CN, and Pu 239/240 at the 200 West Groundwater Treatment Facility? Furthermore, will these constituents be in the injected water in any significant concentration/activity?</p> <p>Basis/Justification: If these constituents aren't treated, then the injected water will be further spreading contamination which seems inconsistent with lowering the risk for HHE.</p>	Please address as directed.	The 200 West Groundwater Treatment Facility is capable of treating groundwater contaminants uranium, technetium-99, nitrate, cyanide and iodine-129. The treatment of the groundwater contaminants was already evaluated in the approved Treatability Test Plan (TTP), (<i>Treatability Test Plan for the 200-BP-5 Groundwater Operable Unit</i> , DOE/RL-2010-74, Rev. 2, May 2015.) During implementation of the TTP the effectiveness and efficiency of the 200 West Groundwater Treatment Facility to treat these contaminants will be further evaluated. This information will be incorporated into the Removal Action Work Plan for the EE/CA as appropriate. The intent of the 200 West Groundwater Treatment Facility is to treat contaminants to below drinking water standards before reinjection. Plutonium-239/240 is not expected to be within the capture zone of the extraction wells.		

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Item 8 P: 5 S: 3.2 L: 31	Comment: What are the attributes of well E33-344? It could not be located in PHOENIX or EDA. Basis/Justification: What is the depth of this well and the screened interval? It's mentioned in the text, but attributes are missing.	Please provide as directed.	Response: No change to text. Well E33-344 is a vadose zone well used for extraction from the perched water zone that is part of the 200-DV-1 OU. Per the well records accessible in EDA (https://ehs.hanford.gov/eda/), the well is screened from 217.9 to 237.1 ft bgs with a 4 inch diameter stainless steel well screen. The well screen overlaps the perched water interval but does not intersect the water table. Additional well details are provided in Figure 3 of DOE/RL-2011-40, <i>Field Test Plan for the Perched Water Pumping/Pore Water Extraction Treatability Test</i> .		
Item 9 P: 5 S: 3.2 L: 31 and Figure 4	Comment: The text does not clearly state why well 299-E33-344 was selected or what specific evaluation determined that selection. In addition, figure 4 should highlight or bold well 299-E33-344 to make it stand out more clearly from the rest of the figure. Basis/Justification: Completeness and accuracy.	Explain more specifically why this well was selected, what positive impact it may have, and reference where this decision was made.	Response: Rationale for selection of this well is provided in Section 4.1 of DOE/RL-2011-40, <i>Field Test Plan for the Perched Water Pumping/Pore Water Extraction Treatability Test</i> . Additional discussion of the 200-DV-1 remedial activities associated with Well 299-E33-344 are provided in DOE/RL-2013-37, <i>Engineering Evaluation/Cost Analysis for Perched Water Pumping/Pore Water Extraction</i> ; and DOE/RL-2014-34 (as referenced on Page 5 line 30 to 31).		

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Item 10 P: 7-9 S: 3.3.1.1-3.3.4 L:	Comment: Include a map illustrating locations of sources of contamination within the B Complex Area and reference it in Sections 3.3.1-3.3.2. Comments 2-6 are <i>examples</i> of this issue throughout the EE/CA. Basis/Justification: Locations of all pertinent features referenced in the document are needed in order to understand the conceptual site model and proposed remedial alternatives.	Include a map illustrating locations of sources of contamination within the B Complex Area and reference it in Sections 3.3.1-3.3.2 discussing sources of contamination.	Response: Accept, Figure 4 will be revised or replaced to include source sites for groundwater contamination described in text.		
Item 11 P: 8 S: 3.3.1.1 L: 2-10	Comment: At least some of the waste discharged to BY cribs originated in B complex SSTs and was scavenged from these tanks, returned, and some supernate was discharged to BY cribs. Basis: Although it is crib waste, some originated in SSTs and that should be mentioned.	Please address as indicated.	Response: Accept, text will be clarified as requested.		
Item 12 P: 8 S: 3.3.1.1 L:10	Comment: The last sentence states “Because of the southeast flow direction, the technetium-99 plume is now inferred to be migrating to the southeast as depicted in figures 5 and 6.” Basis/Justification: Is there proof that the plume is migrating to the SE?	Provide proof that the plume is migrating in the direction stated.	Response: Accept, “now inferred to be” will be deleted from the sentence. Flow direction arrows will be added to Figures 5 and 6. Figure 6 will be updated to use a 2013 plume. The text will revised to include references the annual groundwater monitoring reports (DOE/RL-2014-32, Hanford Site Groundwater Monitoring Report for 2013; and DOE/RL-2013-22, Hanford Site Groundwater Monitoring Report for 2012) which described southeast groundwater flow in the B Complex Area.		

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Item 13 P: 8 S: 3.3.1.1-3.3.1.2 L: 1-23	Comment: BY Cribs are not identified on figures 5 and 6. Locations of wells 299-E33-18, 299-E33-43, 299-E33-15, 299-E33-47, etc., difficult to identify. BY Cribs and wells 299-E33-15 and 299-E22-4 are not identified on figures 9 and 10. Identify 241-BX-102 UPR, 216-B-7&B Cribs and well 299-E33-344. Add these features to figures where missing. Basis/Justification: Locations of all pertinent features referenced in the document are needed in order to understand the conceptual site model and proposed remedial alternatives. Bold or otherwise set apart important features in each figure. 299-E33-18, 299-E33-43, 299-E33-15, 299-E33-47 etc., and reference it in the text of Sections 3.3.1-3.3.4	Identify pertinent cribs and wells on figures.	Response: Accept. The figures will be checked and revised as needed so that wells and waste sites called out in the text are shown on the figures. Figure titles will be changed from “BY Cribs” to “B Complex” (e.g., Figure 5. Technetium-99 near B Complex BY-Cribs (Summer 2011))		
Item 14 P: 9 S: 3.3.3.2 L:14	Comment: Well 299-E33-47 should be highlighted on figure 10. Basis/Justification: Easy to find locations of all pertinent features referenced in the document are needed in order to understand the conceptual site model and proposed remedial alternatives.	Identify well 299-E33-47 on figure 10	Response. Accept.		
Item 15 P: 9 S: 3.3.4 L: Table 1	Comment: The iodine entry needs revision. Basis/Justification: The iodine entry is inaccurate.	Refer to “Iodine” as “Iodine-129.” Also, the MCL for I-129 is 1 pCi/L (yields a dose of 4 mrem/y to the thyroid, assuming water intake of 2 L/d).	Response: Accept, will use Iodine-129. The MCL of 1 pCi/L will be listed in the table.		
Item 16 P: 9 S: 3.3.4 L: Table 1	Comment: It is not clear what concentration goals are set for this action, and how groundwater will be monitored during the treatment phase. [Are the concentration goals given in Table A-2 in the Treatability Test Plan, DOE/RL-2010-74?] Basis/Justification: Concentration goals for the treated/injected groundwater are not given.	Provide a table of concentration goals for the treated groundwater.	Response: Treatment concentration goals for the 200 West P&T are provided in Table D-3 of DOE/RL-2009-124 Rev. 4, <i>200 West Pump and Treat Operations and Maintenance Plan</i> , and will be referenced.		
Item 17 P: 9 S: 3.3.4 L: Table 1	Comment: the asterisk in Table 1.B under MCL on the line for Iodine is not defined in the footnotes Basis/Justification: Need to add definition	Provide definition for the * for iodine	Response. Accept, the * will be changed to the MCL of 1 pCi/L.		

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Item 18 P: 10-15	Comment: Provide better delineation on figures 5 through 10 for the waste site listed in the figure description Basis/Justification: It is difficult to locate the waste site stated in the figure caption if it is not clearly marked on the figure	Marked the waste site so that it is identifiable in the figures.	Response: Accept. The figures will be checked and revised if needed so that wells and waste sites called out in the text are shown on the figures.		
Item 19 P: 16 S: 4 L: n/a	Comment: The primary objective of this NTCRA is to stabilize the site until remedial action, yet it is not stated as an objective in Section 4. Basis/Justification: As stated in Section 1.1, lines 31-32, contaminant levels near the B Complex Area currently exceed federal and state drinking water standards, <u>have increasing trends</u> , and have the potential for further adverse effects on groundwater at the Hanford site. This NTCRA is therefore needed to stabilize the site until remedial action can be implemented. Also see “Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA, EPA/540-R-93-057”, Section 2.5, last two sentences.	Add the following removal action objective as the first bullet: <ul style="list-style-type: none">To stabilize the site (prevent further degradation of water quality) until remedial action, because contaminant levels near the B Complex Area currently exceed federal and state drinking water standards, have increasing trends, and have the potential for further adverse effects on groundwater at the Hanford site.	Response: Not accepted. Disagree with adding this bullet as an objective (see item 21 and 24 responses).		
Item 20 P: 16 S: 4 L: n/a	Comment: Conducting NTCRA under CERCLA requires determination of removal schedule as part of the identification of removal action objectives. Basis/Justification: (EPA/540-R-93-057”, Section 2.5 and OSWER Publication 9360.0-32FS).	In Section 4 include a schedule for conducting the treatability study and implementation of the NTCRA.	Response: Accept with modification. A brief summary schedule, in text form, will be added to this section.		
Item 21 P: 16 S: 4 L: 1-6	Comment: The first and third bullets are not valid as removal action objectives for this NTCRA. Basis/Justification: Regarding the first bullet: BP-5 groundwater is not used as drinking water and there are no plans to use it as drinking water. Regarding the 3 rd bullet: institutional controls are already in place to prevent human exposure to BP-5 groundwater contaminants.	Remove the first and third bullets as objectives of the NTCRA.	Response: Partially accept. The first bullet will be deleted. The second and third bullets will remain. ICs are not yet in place by CERCLA for the 200-BP-5 OU.		

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Item 22 P: 16 S: 6.1 L: 26	Comment: Alternative 1 (no action) would not mitigate plume migration. Basis/Justification: No action would not mitigate plume migration.	Revise text to indicate that Alternative 1 (no action) would not mitigate plume migration.	Accept: “not” will be added to line 26, before “mitigate”.		
Item 23 P: 16 S: 6.2 L: 31-36	Comment: There are no costs described for Alternative 2. Basis/Justification: EPA and DOE guidance require a cost analysis for an EE/CA.	Add cost analysis per the EPA and DOE guidance.	Response: Partially accept. A summary of construction costs for the removal action and annual operating costs will be included.		
Item 24 P: 16 S: 6.2 L: 34-36.	Comment: The sentence incorrectly states that “the proposed action is necessary to protect HHE by preventing further migration of groundwater contaminants”, and does not specify what “foreseeable threat” the NTCRA is expected to rectify. Basis/Justification: The proposed action will not “prevent further migration of groundwater contaminants”, but it is necessary to stabilize the site until remedial action under CERCLA because contaminant levels near the B Complex Area have increasing trends and have the potential for further adverse effects on groundwater at the Hanford site.	Replace the whole sentence “The proposed action is necessary to protect HHE...and to avoid a foreseeable threat.” with the following: “The proposed action is necessary to stabilize the site until remedial action under CERCLA because contaminant levels near the B Complex Area currently exceed federal and state drinking water standards, have increasing trends, and have the potential for further adverse effects on groundwater at the Hanford site.”	Response: Accept with modification. Text will be modified as follows: “The proposed action is necessary to reduce the threat to HHE in the interim by reducing contaminated levels near the B Complex Area that currently exceed federal and state DWS. The contaminant concentrations show increasing trends and have the potential for further adverse effects on the groundwater at the Hanford Site.”		
Item 25 P: 16 S: 6.2 L: 37-38	Comment: Where is the extraction well 299-E33-268 located? Basis/Justification: Reference a figure with the location of this well clearly identified especially since this well will be used in the aquifer test and presumably will be a part of the NTCRA.	Reference a figure where the location of this well is clearly identified. The text on lines 37-38 should also be revised to clarify if the “...possibly one or two other existing wells...” will be also used in the planned aquifer test, and to clarify if the referenced wells will be a part of the NTCRA.	Response: Accept. A reference to Figure 2 will be added.		
Item 26 P: 16 S: 6.2 L: 40	Comment: What is TTP and “TTP Extraction”? Basis/Justification: Need definition of TTP and “TTP Extraction”	Define “TTP” and “TTP Extraction”.	Response. Accept with modification, will use the term “treatability test”.		

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Item 27 P: 16-17 S: 6.2 L: 37-8	Comment: The document does not mention that the perched water being collected in the B Area for DV-1 will also be treated by the 200 West Groundwater Treatment system. Basis/Justification: The system appears close to capacity for nitrate, even without consideration of DV-1.	Provide a discussion of the timing and potential overloading of the system with water from various sources.	Response: Table 2 will be revised to include the inputs from the DV-1 system to demonstrate that the treatment system is capable of handling all planned streams.			
Item 28 P: 17 S: 6.2 L: 6	Comment: Is pipeline buried underground or will be installed above ground? Installed at ground surface? Basis/Justification: Completeness of information.	Clarify construction details of proposed pipeline.	Response: Accept. The sentence ending on line 6 will be modified to read “transferred to the 200 West P&T by aboveground pipeline...”			
Item 29 P: 17 S: 6.2 L: 9-18	Comment: With only 8 ft. of water in the proposed extraction well, will there be sufficient head during drawdown to draw water continuously from a radius of a few hundred feet to consistently feed contaminated water to the 200 W Pump & Treat facility? 2008 data indicated that the pumping rate in the vicinity of the proposed extraction well was approximately 27 gallons per minute? Will flow be sufficient during winter time in freezing conditions? Basis: With changing elevation of the top of basalt, water must be available to extract and meet the current goals for treatment. What is the current flux rate from the vadose zone to groundwater?	Please address as indicated.	Response: The local aquifer materials consists of highly transmissive sediments that are expected to accommodate pumping rates of up to 150 gpm without substantial draw down, as discussed in the Treatability Test Plan. Initial calculations and pumping during well development predicts only a few centimeters of drawdown. Performing the treatability test will provide data needed to further assess performance. Flux from the vadose zone is negligible (e.g., ~5 mm/yr) compared to the amount of water available for pumping from the unconfined aquifer.			

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Item # Page # Section # Line/¶ #s	Comment and Basis/Justification	Modification Needed	DOE Response	Ecology Response	O/C
Item 30 P: 17 S: 6.2 L: 12-28	<p>Comment: It appears that the amount of groundwater in BP-5 will be reduced by the pumping described in this document, while the amount of groundwater in ZP-1 will be increased by injecting water from BP-5 (and other units). It is not clear what this will do to the hydrogeology in 200 East and 200 West, if anything. Also, the water from BP-5 may introduce new contaminants into ZP-1 (the contaminants that escape treatment, including contaminants other than those on Table 2 that were not kept as COCs but will be injected into ZP-1).</p> <p>Basis/Justification: The treatability test plan for this remedial action did not address these issues.</p>	Discuss the effect of pumping on the hydrogeology of both 200 East and 200 West, and the ability of the pump and treat system to remove all of the contaminants present in wells 299-E33- 38, 299-E33-342, and 299-E33-42.	<p>Response: The water levels in the BP-5 area will only be effected locally at the pumping well 299-E33-268. However, the effect from pumping is expected to be minimal. Pumping during well development at 100 gpm resulted in 0.2 feet of drawdown. See also response to Comment #29. Data collected from the treatability test will be used to evaluate capture and removal of the B-complex plumes. This will be used to prepare a removal action work plan (following an Action Memorandum) that will describe the design and implementation of the removal action. Hydraulic modeling will be performed as part of the design process to assess impacts. 200 East/200 West Area scale impacts are not expected to be measureable.</p> <p>As discussed in response to Comment #16, Treatment concentration goals for the 200 West P&T are provided in Table D-3 of DOE/RL-2009-124 Rev. 4, <i>200 West Pump and Treat Operations and Maintenance Plan</i>.</p>		
Item 31 P: 18 Figure 11	<p>Comment: The blue lines that are marking the various groundwater operable units are not correct. There is an unlabeled area in the lower right hand corner and an unmarked triangle in the upper middle of the figure.</p> <p>Basis/Justification: need to completely label figures</p>	Add labels to these areas.	Response. Accept with modification. The OU boundaries shown are current and correct. The figure will be modified to only show the 200-BP-5 OU boundary.		

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Item 32 P: 18 S: 6.2 L: Figure 11	Comment. Please complete the title of figure 11. Basis: The title of figure 11 is incomplete.	Complete the title of figure 11.	Response: Accept. The figure caption will be completed to read “....200 East Area to the <u>200 West groundwater treatment facility.</u> ”		
Item 33 P: 21 S: n/a L: n/a	Comment: Figure 14 appears to show uniform and consistent hydraulic conductivity in the region surrounding the extraction well. This seems an unreasonable assumption, given the heterogeneity of the glaciofluvial sediments that constitute the aquifer in this area. Basis: Please justify the apparent modeling assumption of uniform hydraulic properties in the capture zone.	Please address as indicated.	Response: The model used (as referenced in the ECF below the figure) was a local scale fate and transport model. The model used a single conductive layer for the simulations representing the unconfined aquifer in this area which has been defined as Hanford / Cold Creek gravels, and the hydraulic parameters for these two units are indistinguishable. The model used a variable top of basalt elevation. The purpose of the model was to evaluate potential placement for groundwater extraction well(s), and the use of a single hydraulic conductivity value for the relatively small model domain was reasonable to accomplish the modeling objective.		
Item 34 P: 22 S: 7 L: 2-4	Comment: Requirements quoted for performing this EE/AA are stated to fall under EPA 540-R-93-057, Guidance on Conducting Non-Time-Critical Removal Actions under CERCLA is using a ‘Fact Sheet’ as a driver to conduct this EE/CA; this is unacceptable. The actual Guidance document that must be used as the driver allowing this EE/CA specifically is <i>Guidance on Conducting Non-Time-Critical</i>	Rewrite the EE/CA to satisfy most of the applicable elements of <i>Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA</i> (EPA540-R-93-057, Aug. 1993).	Response: This EE/CA has been developed using the stated reference and other EPA and RL guidance documents on removal actions. This document meets the requirements of 40 CFR 300.415 and provides sufficient information for the lead agency, RL, to present to the public the preferred alternative for the removal action. No additional changes to the document.		

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	<p>Removal Actions Under CERCLA (EPA540-R-93-057, Aug. 1993). If the text is a typo, then fix the text reference.</p> <p>However, if this EE/CA said to follow this EPA guidance as well as requirements for a following Action Memorandum, then the EE/CA fails to meet the many suggested activities required and/or highly recommended by this guidance (EPA540-R-93-057, Aug. 1993). For example:</p> <p>Basis/Justification: This EE/CA fails the requirements of the vast majority of guidance from <i>Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA</i> (EPA540-R-93-057, Aug. 1993).</p> <ul style="list-style-type: none">1) The EE/CA fails to satisfy the objectives for cost and effectiveness.2) The EE/CA fails to provide or clarify a finding or threatened release that is present with a finding of an imminent and substantial endangerment, and that this removal action is clearly needed at this time and location.3) The EE/CA fails to provide estimated projected costs of alternatives.4) The EE/CA fails to have a reasonable alternative to send effluents to ETF of a comparison to the preferred alternative.5) The EE/CA fails to develop a conceptual site model that clearly identifies releases, contamination, COCs, possible routes of exposure, possible routes of contaminant transport, and potential exposure pathways.6) The EE/CA fails to describe any previous or future removal actions near the site.7) The EE/CA fails to provide quantifiable data of any sort collected for the EE/CA.8) The EE/CA fails to specify or consider possible long-term actions and corresponding cleanup levels.9) The EE/CA fails to provide adequate risk analysis to ensure all risk assessment activities are consistent with future remedial action remaining to be taken to achieve consistent risk goals.10) The EE/CA fails to discuss the statutory limits on removal actions of \$2 Million and 12-month removal actions.11) The EE/CA fails to provide a schedule for the removal activities, both start and completion time.				

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	12) The EE/CA fails to describe how each alternative protects HHE in a consistent manner including long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs. 13) The EE/CA fails to adequately consider environmental conditions, including temperature and time of year impacts (i.e. freezing and the need to maintain a minimal liquid flow). 14) The EE/CA fails to provide a comparative analysis to identify advantages and disadvantages of each alternative (this could be relatively easy if there is a comparison to sending effluent to ETF). 15) The EE/CA fails to discuss the state (Ecology) and their role in this proposed activity.				
Item 35 P: 22 S: 8,9 L: n/a	Comment: The EE/CA should include the sections specified in EPA/540-R-93-057 and OSWER Publication 9360.0-32FS. In particular, needed is a section “Effectiveness” with evaluation of effectiveness in terms of protectiveness and ability to achieve removal objectives, as specified in Exhibit 7 of EPA/540-R-93-057 Basis/Justification: EPA/540-R-93-057 and OSWER Publication 9360.0-32FS	Replace current sections titled “8. Overall Protection of Human Health and the Environment” and “9. Overall Ability to Achieve ARARs” with a section titled “Effectiveness”, and follow Exhibit 7 of EPA/540-R-93-057 to evaluate effectiveness of the remedial alternatives. Effectiveness should be evaluated in terms of the alternative’s objective within the scope of the removal action and ability to achieve removal objectives as defined in Section ”Effectiveness” of EPA/540-R-93-057.	Response: This EE/CA meets the intent of the both EPA and RL guidance and 40 CFR 300.415 and no additional changes to document.		
Item 36 P: 22 S: 8 L: 19	Comment: Alternative 2 would not result in “preventing exposure to contaminated groundwater.” DOE already has measures in place to prevent anyone from being exposed to contaminated groundwater. Basis/Justification: Incorrect understanding of what the NTCRA could/would accomplish.	Revise this sentence to state that: “Alternative 2 would stabilize the site until remedial action by intercepting and removing contaminants within the radius of influence of the proposed extraction wells. This would prevent further adverse effects on groundwater from leaking single shell tanks and contaminated vadose zone.”	Response. Accept with modification, text will be modified, EXCEPT for last sentence “ <i>This would prevent further adverse effects on groundwater from leaking single shell tanks and contaminated vadose zone</i> ” which will not be included. Vadose zone source control is not the subject of the EE/CA		

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Item 37 P: 23 S: 10 and Figure 11 L: 3-4	Comment: The pipeline crosses roughly the northwest portion of 200 East area, and may cross over waste areas that will require remediation at some point in the future. Basis/Justification: It appears that the pipeline crosses close to or over UPR 200-E-58, and sites 200-E-20 and 218-E-10.	The document should describe any waste areas that the pipeline crosses, and whether or not those waste areas will require remediation during pipeline installation. If the pipeline crosses waste areas that need remediation, the document should describe how remediation efforts will be accommodated around the pipeline.	Response: The aboveground pipeline does not cross currently identified waste sites. The pipeline crosses between 200-E-20 and 218-E10. If the pipeline interferes with future waste site remediation, movement of the aboveground pipeline will be evaluated.			
Item 38 P: 23 S: 10 L: 3-4	Comment: Figure 11 does not include injection wells and pipelines from 200 West P&T to associated injection wells. Revise figure 11 or include another figure. Basis/Justification: Figure 11 does not include pipelines referenced in the text.	Needed is a figure that illustrates the location of the injection wells and pipelines to injection wells.	Response: Accept with modification. Remove reference at end of sentence to Figure 11.			
Item 39 P: 23 S: 10 L: 6-14 and 18-26	Comment: Please clarify the source of the italicized text. Italics make text appear to come from CERCLA 104(d)(4), but this is clearly not the case (given Hanford specific references). Basis/Justification: Text should be appropriately documented, and use of italics/formatting should be explained.	Clarify the source and rationale for the italicized text.	Response: Accept. The italics from the text will be removed. A reference will be added to the end of line 5. The words “Treatability Test” will be deleted from lines 11 and 23.			
Item 40 P: 22 S: 10 L: 19-20	Comment: If you cannot achieve your extraction goals of 75 – 150 gpm for contaminated groundwater, how much more protective is this alternative compared to the no action alternative, and is it worth the cost? Basis: Justify the cost of this treatment alternative if the proposed action does not meet its extraction (and therefore treatment) goals.	Please address as indicated.	Response: As discussed in Section 6.2 (line 38), connection of additional wells, if needed, will be evaluated as part of the removal action work plan. Based on results from pumping of well E33-268 during well development (see responses to Items #29 and #30), sufficient groundwater is expected to be available to meet the extraction goals.			

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Item 41 P: 22-3 S: 10 L: 35-6 and 39-2 on next page	<p>Comment: The sentence states “Contaminants identified in the 200-BP-5 OU GW are provided in Table 1.” Are these <u>all</u> of the contaminants and co-contaminants considered to be applicable in relation to the 200-BP-5 WP? Are these <u>all</u> of the contaminants and co-contaminants actually found in the aquifer? Are these the <u>only</u> contaminants and co-contaminants that the ZP Treatment Plant can treat?</p> <p>The statement is made “Injection of treated GW in the 200 East Area may be evaluated as part of the remedial design/remedial action work plan (RDR/RAWP) (DOE/RL-97-36, 200-UP-1 Groundwater Remedial Design/Remedial Action Work Plan).” What is the point of this statement? 200-UP-1 has little to do with 200-BP-5. If there is some validity of adding this statement, then put it into the correct context of this EE/CA and 200-BP-5 OU.</p> <p>Basis/Justification: Completeness and accuracy.</p>	Please clarify the contaminants and co-contaminants in the text by answering the comment questions. Add text as to the context of these actions.	<p>Response: These are the contaminants above groundwater standards that apply to the proposed removal action. Tritium is not directly treated by the treatment plant. Concentrations of tritium are blended and re-injected below the drinking water standard. Low levels of iodine-129 are removed during treatment by the ion exchange system as described in Section 3.1.1, page 3-1 of DOE/RL-2013-14, <i>Calendar Year 2012 Annual Summary Report for the 200-ZP-1 and 200-UP-1 Operable Unit Pump-and-Treat Operations</i>.</p> <p>The reference to the 200-UP-1 RD/RAWP will be deleted.</p>		
Item 42 P: 22 S: 10 L: 39	<p>Comment: The EE/CA must address the disposition of the treated groundwater. The statement that this water “<i>may be evaluated as part of</i>” some other action is not acceptable. Also, it appears to contradict the information on page 23, lines 3-14.</p> <p>Basis/Justification: The EE/CA must address the disposition of all the waste streams generated during the remediation.</p>	The EE/CA must specify the disposition of the treated groundwater.	Response: Groundwater treated during the implementation of the EE/CA will be reinjected back into the aquifer in 200 West. The sentence will be revised to clarify that the evaluation of where water will be reinjected in the future (200 East and 200 West) will be part of the 200-BP-5 CERCLA RI/FS process.		

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Item 43 P: 23 S: 11 L: 39-40	Comment: “Protectiveness of HHE” is not equivalent to effectiveness. Effectiveness is the ability to achieve removal objectives (i.e., stabilization of the site, and the objectives listed in the 2 nd bullet of Section 4 of the submitted document). Basis/Justification: EPA/540-R-93-057, Section 2.6, Exhibit 7 and OSWER Publication 9360.0-32FS.	Evaluate effectiveness by addressing each of the sub-criteria listed in Exhibit 7 of EPA/540-R-93-057.	Response: Comment noted. The effectiveness of the alternative has been discussed in other sections of the EE/CA (e.g., Section 6.2, page 17 lines 19 to 28 and Figure 14). No change to the document.		
Item 44 P: 23 S: n/a L: n/a	Comment: An explanation is needed why cost evaluation was not included. Basis/Justification: The goals of the EE/CA are to identify the objectives of the removal action and to analyze various alternatives that may be used to satisfy these objectives for cost, effectiveness, and implementability (EPA/540-R-93-05, Section 1.2, 2 nd bullet.)	Include an explanation, for example that cost information would not be a factor in comparing the no action alternative against the recommended alternative (i.e., there is no cost associated with no action).	Response: Partially accept. Will provide construction costs and Annual O&M costs (as discussed in response to Item #23).		
Item 45 P: 24 S: 11 L: Table 2	Comment: It would be helpful to narratively describe treatment (as shown in figure 12) of an example contaminant (e.g., Tc-99), so the reader can more easily understand the changes in concentration data presented in Table 2. Basis/Justification: The treatment train needs to be clearly described.	As an example, narratively describe treatment (as shown in figure 12) of a single contaminant (e.g., Tc-99), so the reader can more easily understand changes in concentration data presented in Table 2.	Response: Accept with modification. The treatment of contaminants is shown on Figure 12. Text will be added to reference the treatment processes that are further described in the 200-ZP-1 O&M Plan (DOE/RL-2009-124).		
Item 46 P: 24 S: 11 L: Table 2	Comment: The treatment train does not appear to treat BP-5 groundwater in terms of I-129 and H-3, yet their concentrations (with BP-5 flow) are reduced from the initial to final treatment components. Clarify if this is solely due to dilution by extraction well water from U Plant and 200-ZP-1 (as shown in figure 12). Basis/Justification: The treatment train needs to be adequately described.	Clarify how mixing of extraction well water (from B Complex, U plant, and 200-ZP-1, as shown in figure 12) affects concentrations of contaminants (e.g., dilution), listed in Table 2.	Response: Calculations presented in Table 2 do not take credit for tritium treatment. Iodine-129 is currently being removed by the Tc-99 Ion Exchange Resin in the 200 West Treatment System. Text will be added to describe that the water from 200-BP-5 is combined with the water extracted from the 200-ZP-1 and 200-UP-1 OUs. The combined flows can be treated by the 200 West Treatment System. A new table will be added showing the maximum influent concentrations to the 200 West P&T facility expected from the 200-BP-5 removal action.		

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Item 47 P: 27 S: n/a L: n/a	Comment: Use WCH-191 Rev 4 from April 29, 2015 instead of WCH-191 Rev 2 from 2010. Basis/Justification: Confirming most recent and complete data sets utilized for decision making processes.	Use most recent version or justify use of previous version.	Response: Accept. Reference will be updated to Rev. 4.			
Item 48 P: A-2 S: A1 L: Table A-2	Comment: Add MTCA as an ARAR. Basis/Justification: MTCA applies to this EE/CA.	Add MTCA cleanup standards to Table A-2 (WAC 173-340-700 through -760).	Response: Since this removal action is not to restore the groundwater but just to remove contaminant mass and control plume movement, neither federal nor state drinking water standards or state cleanup criteria under MTCA are pertinent to this removal action.			
Item 49 P: A-5	Comment: Use DOE/RL-2009-124 Rev 3 from November 17, 2014, instead of Rev 2 from 2013. Basis/Justification: Confirming most recent and complete data sets utilized for decision making processes.	Use most recent version or justify use of previous version.	Response: Accept with modification. Reference will be updated to Rev. 4 (published August 2015).			